



جائزة محمد بن راشد آل مكتوم للأعمال
MOHAMMED BIN RASHID AL MAKTOUM BUSINESS AWARD

EXPORT 2005 التصدير
MANUFACTURING 2006 الصناعة
MANUFACTURING 2010 الصناعة
JAEZA

CO₂ FIRE SUPPRESSION SYSTEM



THE FIRE PROTECTION SPECIALISTS



INTRODUCTION

National Fire Fighting Manufacturing FZCO (NAFFCO) was established in 1991 and has grown to become the largest fire fighting equipment manufacturer in the Middle East and one of the top manufacturers worldwide.

The company's core business focuses on design, manufacture, supply, installation and after sales services with our highly trained and experienced technicians and engineers for fire fighting products ranging from basic fire extinguishers to highly sophisticated fire engines. The company provides total fire protection solutions to the most prestigious developments around the world, including residential buildings, commercial complexes, telecommunication centers, industrial installations, oil refineries and petrochemical plants and airport installations.

With its presence in over 100 countries, NAFFCO headquarters is located in United Arab Emirates, where a wide range of innovative fire fighting equipment are manufactured with the company's state-of-the-art technology.

The company is renowned for providing superb quality and assuring the timely performance of its products at all times. With simple yet effective fire extinguishers of all sizes, custom made fire cabinets, heavy duty fire hoses, high capacity powerful pumps, mobile fire fighting systems, including CAFS systems, and highly advanced fire engines, NAFFCO dedicated itself to the science of fire fighting.

Moreover, NAFFCO has diversified from the passive fire protection arena and considered as one of the top specialized manufacturer of the entaire range "Fire Fighting Products, Systems, Fire Detection and security systems".

NAFFCO's ISO 9001 QUALITY MANAGEMENT SYSTEM is certified by UL DQS inc, LPCB and BV. This organization endeavors to continually and effectively improve the quality of our products which are certified by international bodies like UL, FM, LPCB, BSI, SAI Global and SABS in accordance with the international standards of NFPA.

As recognition to the success of our business growth, we have been accredited thrice with the prestigious Mohammed Bin Rashid Al Maktoum Business Award, in the year 2005 for excellence in exports, in 2006 & 2010 for manufacturing excellence under the free zones category. Furthermore as a manufacturer of complete fire protection solution provider, NAFFCO has also been recognised by the Dubai Quality Appreciation Program 2008, which is a testimony to our commitment to quality and consistent focus on business excellence.

Motivated by our slogan "Think Safety, Think NAFFCO!" we strive to be the global leader in providing comprehensive and reliable fire protection solutions to make the world a safer place to live in.



CO₂ FIRE SUPPRESSION SYSTEM

The Carbon Dioxide (CO₂) Fire Suppression System is an engineered system using either a fixed nozzle agent distribution network, hose reel(s), or a combination of both.

NAFFCO CO₂ Systems are designed in accordance with the latest revision of the National Fire Protection Association (NFPA) Standard 12, "Carbon Dioxide Extinguishing Systems". When properly designed, the carbon dioxide system will extinguish fire in Class A, B, and C hazards by depleting oxygen in the room which supports combustion.

The system can actuate by detection and control equipment for automatic system operation along with providing local and remote manual operation as needed. Accessories are used to provide alarms, delay discharge, ventilation control, door closures, or other auxiliary shutdown or functions. Due to the method of extinguishment, personnel occupying areas protected by carbon dioxide systems must be evacuated prior to system discharge. For this reason, discharge time delays and alarms are mandatory for occupied hazards. Two or more hazard areas can be protected with a single group of agent storage containers (cylinders) by means of directional or selector valves.

Basic Use: The Carbon Dioxide system is particularly useful for suppressing fires in hazards where an electrically non-conductive medium is essential or desirable; where clean-up of other agents presents a problem; or where the hazard obstructions require the use of a gaseous agent. The following are typical hazards protected by carbon dioxide systems:

- Printing Presses
- Vaults
- Open Pits
- Dip Tanks
- Spray Booths
- Ovens
- Engine Rooms
- Coating Machines
- Process Equipment
- Hoods And Ducts
- Flammable Gas Or Liquid Storage Areas
- Generators

CO₂ HIGH PRESSURE CYLINDER

The high pressure seamless steel CO₂ cylinder has concave base and manufactured in accordance with 84/825 EEC.

MATERIAL	
Cylinder	Steel
Head Valve	Brass
HYDRAULIC TEST PRESSURE	
Test Pressure	250 bar
FINISH	
Primed and painted in accordance with BS 4800 : 04 E 53	
CAPACITY & DIMENSION	
Model No.	Cylinder Capacity
NCO ₂	45 Kg (68 Ltr.)



CO₂ SOLENOID HEAD VALVE

CO₂ Head Valve with solenoid valve can be use as head of:

- Master Cylinder Head Valve
- Pilot Cylinder Head Valve

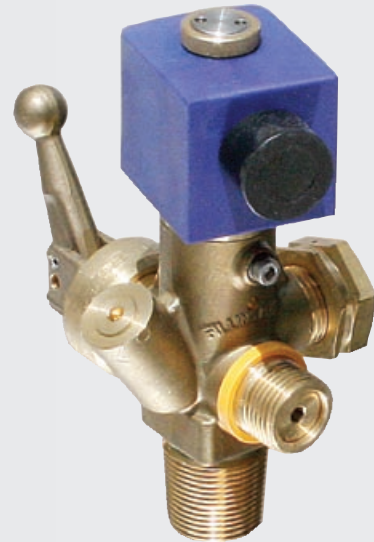
CO₂ Head Valve can be actuated by two methods of operation:

- Manual / Mechanical actuator
- Electric solenoid actuator

MATERIAL	
Valve Body	Brass
Inlet Connection	25E EN 629-1
Outlet Connection	w21.8 x 1/14" DIN 477
Dip Tube Connection	m10 x 0.75
Bursting Disk	To be specified

OPERATING PARAMETER	
Working Pressure	250 Bar
Temperature Rating	-20°C - +60°C
Seat Orifice Size	12mm
CO ₂ Discharge Rate	45 kg/min
Discharge Rate	Kv = 0.69
	Cv = 0.80
Operation	Total Discharge

ELECTRICAL REQUIREMENT	
Operating Voltage	24 VDC
Power Consumption	10 Watts



CO₂ DIFFERENTIAL PRESSURE HEAD VALVE

The differential pressure discharge head valves are use to be install in CO₂ Cylinders to facilitate the discharge flow and installing the actuation device. The valve can be operated by electric actuator, pneumatic actuator or pneumatic manual actuator. Actuation of the control head displace the valve piston and CO₂ is allow to flow through the discharge port of the valve.

MATERIAL	
Valve Body	Brass
Inlet Connection	25E EN 629-1
Outlet Connection	w21.8 x 1/14" DIN 477
Dip Tube Connection	m16 x 1
Release Device Connection	M42 x 1.5
Bursting Disk	To be specified

OPERATING PARAMETER	
Working Pressure	250 Bar
Temperature Rating	-20°C - +60°C
Seat Orifice Size	12mm

RELEASE DEVICE	
Manual/Pneumatic	20 Bar
Pneumatic	10 Watts
Pneumatic Double Piston	10 Bar
Pyrotechnic	24 VDC
Electromagnetic	1 Ampere



CYLINDER VALVE ASSEMBLY

The cylinder valve assembly is a forged "brass" body. When the actuation pressure reaches 100 to 110 psi (689 to 758kPa), the valve opens automatically. Exceeding 3000 psi (20,685kPa) pressure in the cylinder, a safety relief disc, inserted into all valves, will rupture and a pilot port will be utilized for two aims:

- Fill port for charging the cylinder
- Actuator port for both the manual/mechanical and electrical release functions

To settle the valve, two plugs must be removed and either the 12VDC or 24VDC actuation kit must be installed. For marine applications, the local lever actuator assembly must be installed for converting slave configuration to a master valve.

Operation:

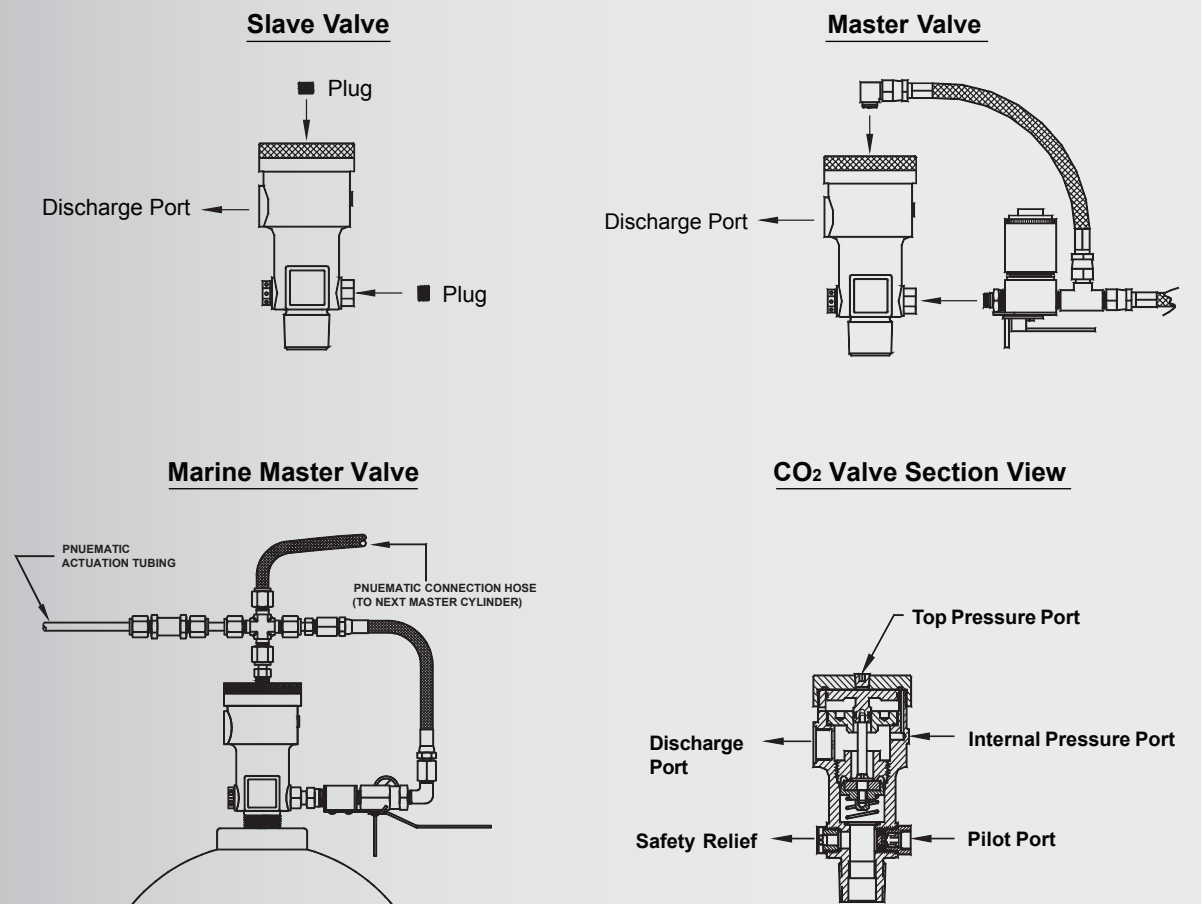
By entering through the valve discharge port, CO₂ pressure from piping manifold send pressure to the top piston chamber. Then, the slave valve cylinder is actuated.

The greater surface area of the piston allows discharging CO₂ through the discharge port into the piping system, since the pressure pushes the main seal downward.

The pilot port send CO₂ pressure of the cylinder to the top pressure port and the master valve cylinder actuates.



SPECIFICATIONS	
Materials	Valve – Brass Pilot Port - Stainless Steel
Operating Pressure	100 to 110 psi (689 to 758 kpa)



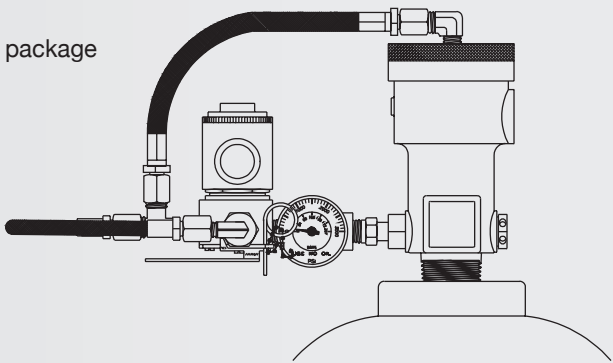
MASTER CYILINDER ACTUATION PACKAGE

The NAFFCO Carbon Dioxide Master Cylinder Valve can be actuated by two methods of operation:

- Manual / Mechanical actuator
- Electric solenoid actuator (12VDC or 24VDC)

The 12VDC and 24VDC Master Cylinder actuation package contain the following items:

- 12VDC or 24VDC electric solenoid
- Manual Actuator
- (2) Stainless Steel Flexible hoses
- Stainless Steel connector
- (2) ¼” (8mm) X 90 Brass elbows
- 14” (8mm) Brass tee



Ex-Proof Solenoid with Pressure Gauge

The 12VDC and 24VDC solenoids meet the requirements of N.E.C Class 1, Group C & D and Class II Group E, F & G applications. A manual actuator is provided for local “override” purposes. For manifold cylinder applications, the manual actuators can provide simultaneous discharge of the master cylinders by connecting together. After Operation, the electric or manual actuator can be reset without tool. For service, maintenance and inspection purposes, the master actuation package can be removed from the valve / cylinder even when the cylinder is full.

DESCRIPTION	
Part Number	C85-113 12VDC Master Cylinder Actuation Package C85-114 24VDC Master Cylinder Actuation Package C85-115 12VDC Solenoid w/Pressure Gauge C85-123 24VDC Solenoid w/Pressure Gauge
Materials	Brass and Stainless Steel
Temperature Range	0°F to 130°F (-18°C to 54°C)
Approvals	U.L. Ex4447 Factory Mutual U.L.C. CEx 1312

CO2 MANUAL/PNEUMATIC RELEASE ACTUATOR

The CO2 manual/pneumatic release is device required for slave actuation. This is a dual-purpose device, can be used as mechanical manual actuation or thru pilot line. It has an actuation piston to upset the discharge head valve when pilot pressure is applied to a piston. With the pressure applied through the pilot connection or by pulling, the lever of the pneumatic manual actuator presses the pressure differential head valve piston, thereby opening the cylinder to discharge its content.

MATERIAL	
Valve Body	Brass
Inlet Connection	M42 X 1.5
Pneumatic Connection	G 1/8”
OPERATING PARAMETER	
Working Pressure	
20 Bar for 300 Bar System	Pmax = 340 Bar
15 bar for CO2 and 200 Bar System	Pmax = 250 Bar
10 Bar for System	Pmax = 150 Bar



CO2 PNEUMATIC RELEASE ACTUATOR

The pneumatic actuator has a piston and it connected to a pin at the top of pressure differential head valve. When pilot pressure is applied to the piston pressure press the pin pushing the head valve diaphragm, thereby causing cylinder head valve to open.

MATERIAL	
Valve Body	Brass
Inlet Connection	M42 X 1.5
Pneumatic Connection	G 1/8”
OPERATING PARAMETER	
Working Pressure	
20 Bar for 300 Bar System	Pmax = 340 Bar
15 bar for CO2 and 200 Bar System	Pmax = 250 Bar
10 Bar for System	Pmax = 150 Bar



CO2 FLEXIBLE DISCHARGE HOSE



The flexible discharge hoses are made to convey the CO2 gas from the cylinder head valves to the main manifold for gas distribution to nozzle piping network. The Discharge Hoses are equipped with an internal check valves to prevent the back flow of CO2 gas from the manifold to other cylinders.

MATERIAL	
Hose	Rubber
Coupling	Steel S 300 Cadmied
PRESSURE RATING	
Service Pressure	240 Bar
Test Pressure	400 Bar
Bursting Pressure	960 Bar
DIMENSION	
Connection	21.7 x 1.814
Diameter Nominal	10 mm

CO2 FLEXIBLE PILOT HOSE



The pilot flexible hose is used to interconnect the ports of the pressure actuators. The CO2 gas pressure applied on the pressure actuators open the cylinder valve simultaneously.

MATERIAL	
Hose	Rubber
Coupling	Steel S 300 Cadmied
Connection	1/8” BSP
PRESSURE RATING	
Service Pressure	240 Bar
Test Pressure	400 Bar
Bursting Pressure	960 Bar

CO₂ DISCHARGE NOZZLE

Nozzle is made of brass and available in ½", ¾" and 1" sizes. Orifice design to particular requirement with computer aided calculation to assure the effectiveness of extinguishing agent and reliable system design. The nozzles can be located around the perimeter or in the center of the protected space. The nozzles are available for both 180° and 360° discharge pattern.



GAS WEIGHT MONITORING SYSTEM



NAFFCO Continuous Gas Weight Monitoring System is used in gas based fixed Extinguishing Systems to monitor the weight of extinguishing agent in the cylinder to meet the NFPA Standards.

Once in 6 months, Loss in Weight of cylinder must be checked and when it is superior to 10%, refilling must be done, in accordance with NFPA-12. One gas weighing device is required for each cylinder. This cylinder will be fixed through gas weighing device in hanging conditions.

If the weight of gas drop to 5% or 10% (depends on type of gas system), the low weight is indicated by means of LED indication. After reception of low weight indication from cylinder bank, the Gas Weight Monitoring Control panel gives audio and visual indication.

For remote indication or other relevant signaling, 2 set of potential free NO and NC contacts are available.

NAFFCO CONTINUOUS GAS WEIGHING DEVICE

MODEL: SD-GAS-W1000

NAFFCO gas weighing device is used in gas based fixed extinguishing systems to monitor the weight of extinguishing agent in the cylinder to meet the NFPA Standards

- LED indication for low weight of agent
- Cylinder ring to be standard thread of cylinder neck
- Non-standard threads, suitable ring will be provided upon request
- LED indication for low weight of agent
- Cylinder ring to be standard thread of cylinder neck
- Non-standard threads, suitable ring will be provided upon request

- Standard length of hanger rod is used with ring for hanging the cylinder
- Low weight indication can be calibrated at the site, if required
- Device is powered directly by two wires from the Gas Weight Monitoring Control Panel
- Plug in type simple connection form on device to another
- Each cylinder is required on device
- 24VDC signal supply is derived from weighing device. No current consumption by gas weight monitor during normal conditions. While low weight indication is ON, the maximum current consumption will be 10mA



NAFFCO GAS WEIGHT MONITORING CONTROL PANEL

MODEL: SD-GAS-CP

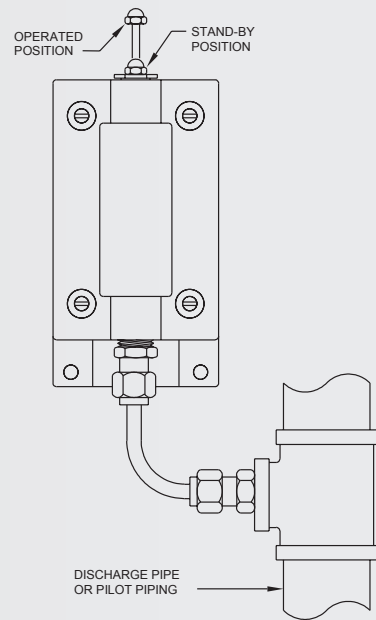
Naffco Gas Weighing Control Panel supervise and indicate the status of Continuous Gas Weighing Device, which are holding the gas cylinders used in gas based fire suppression / extinguishing system



- Input supply voltage in 24VDC/230VAC/110VAC/50Hz
- Operating Voltage 24VDC
- Lamp test, acknowledge and rest control switches
- System ON Green LED, Low Weight Orange LED, Open and Short Yellow LED
- Unbolt Fault Buzzer of continuous lane
- Two wire, wiring is provided only common low weight indication per zone(individual low weight indication is available on continuous gas weighing device)
- This is Single Zone Control Panel

- Unbolt low weight indication buzzer (intermediate tone)
- Supervision facility for open and short of connecting cable of continuous gas weighing device
- Maximum continuous gas weighing device per unit is restricted to 20nos
- Provision of one set of low weight fault repeating potential free NO and NC contact of rating 6amp at 24VDC
- Wall mounting type suitable for indoor use

PRESSURE SWITCH

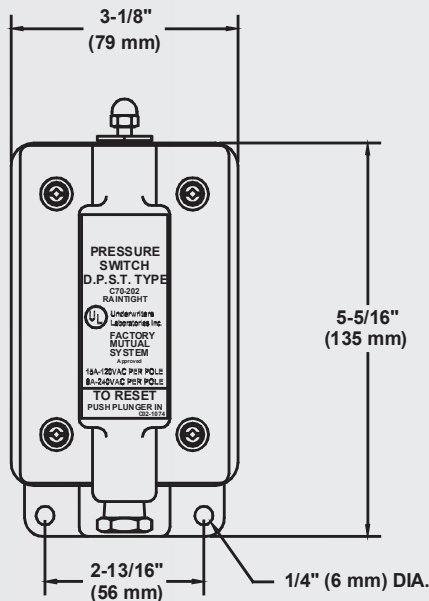
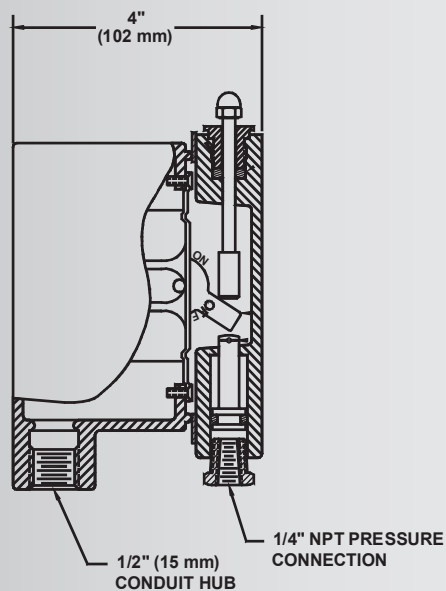


Application

By providing electrical tie-in, The C70-202 Pressure Switch allows to indicate on the control panel that the CO₂ system has been activated. The pressure switch can also open or close electrical circuits for various functions like to indicate equipment is shutdown or alarm is activated.

Note: The pressure switch will not transfer during the pre-discharge period. Therefore, the switch is not suitable for an evacuation alarm signal.

After operation, the pressure switch must be reset prior to resetting the control panel.



The pressure switch is a double pole, single throw switch housed in a weather-proof back box. After the activation of system, the CO₂ pressure from discharge piping operates the switch.

Installation

The switch should be in the vertical position and mounted on a suitable surface. According to NFPA 12 requirements, it must use 1/4 inch (8mm) piping to make the connection. Furthermore, it must use branch tees in the 1/4 inch (8mm) piping for installation of additional pressure switches. Thus, the pressure switches are “daisy-chain” together.

DIRECTIONAL VALVES

Multiple hazards may be protected from a common supply of CO₂ by using pneumatically operated directional valves. This is essentially an economy measure designed to reduce system size. It is also used only when it is certain that only one hazard could require a discharge at any time. It is operated pneumatically by gas pressure through cartridge system which can be actuated manually/electric actuator/solenoid valve.



Model No:	Test Pressure (bar)	Size	Material
DV40A	250 bar	40	Bronze BC6
DV50A	250 bar	55	Bronze BC6
DV65A	250 bar	65	Bronze BC6
DV80A	250 bar	80	Bronze BC6
DV100A	250 bar	100	Bronze BC6
DV125A	250 bar	125	Bronze BC6
DV150A	250 bar	150	Bronze BC6

FIRE ALARM DEVICES

EXTINGUISHANT CONTROL PANEL

Shield XT is a new generation extinguishant releasing panel which is fully compliant with European standard BS EN12094-1. (Fixed firefighting systems – components for gas extinguishing systems). The simple, programmable configuration options and easy to install construction make Shield XT panels the ideal choice for small to medium sized systems using all extinguishant agents.



Features

- Complies with EN12094-1
- Three detection zones as standard
- Any single zone or any combinations of zones can be configured to release
- Configurable first stage sounder delays
- Configurable detection delays
- Zero time delay upon manual release option
- Compatible with I.S. barriers
- Non-latching zone input option to receive signals from other systems such as aspirating equipment
- Configurable extinguishant delays up to 60 seconds in 5 second steps
- Configurable extinguishant duration up to 5 minutes in 5 second steps
- Countdown timer shows time remaining until release
- Supports up to seven, four wire status indicators
- Built in Extract Fan control



CONVENTIONAL PHOTOELECTRIC SMOKE DETECTOR

D-C401 Conventional Photoelectric Smoke Detector is non-addressable. Used together with end of line unit, it can connect with compatible control panels to process detection signals. It shows fire alarm by LED indicators and transmits the fire signal to the control panel. Using infrared scattering technology, the smoke density can be detected. The detector receives very weak infrared light under normal smokeless condition. If smoke particles enter the chamber, the received light signal will increase by scattering. When smoke density reaches a pre-set level, the detector will alarm out. In order to reduce interference and power consumption, the emitting circuit works in pulse mode to prolong the life of IR LED.

Features

- Twin LED for 360° view.
- Remote indicator output available.
- Complies with EN 54-7 standard.



CONVENTIONAL RATE OF RISE AND FIXED TEMPERATURE HEAT DETECTOR

D-C402 Conventional Rate of Rise and Fixed Temperature Heat Detector is non-addressable. With built-in microprocessor, it works stably with reliable fixed fire judging program. Used together with an active end of line unit (AEOL), it can connect with compatible control panels to process fire alarm signals. It transmits fire signal to fire alarm control panel or interface module by changing its own current and shows the fire alarm by LED indicator until it's reset.

Features

- Twin LED for 360° view.
- Built-in microprocessor samples and collects data in real time.
- Rate of rise and fixed temperature alarm modes
- Remote indicator output available.
- Complies with EN 54-5 standard.



CONVENTIONAL SOUNDER STROBE

S-C481 Conventional Sounder Strobe is a kind of audible and visual alarm device used to warn people in field when fire occurs. It can give audible and visual alarm when applied to 24VDC power (D1 connected with anode and D2 with cathode). To connect it with fire alarm control panel, an addressable control module should be added to the system, such as AI-510 Addressable Single I/O Module. Both shallow base with 25.5mm high and deep base with 40mm high are available, deep base is used if there is no special statement in this manual.

Features

- High bright red LEDs are used as light source.
- High sound level, over 75dB at 3m ahead horizontally (A weighted).
- Circuitry and base are twisted together.
- Standard: EN 54-3.



FIRE ALARM BELL

The FB-1000 series Bells are of aluminum construction and have a very high sound output matched with extremely low power consumption with 20mA for the 6" alarm bell. The FB-1000 series can be used for internal and external installation using the specially designed weatherproof bells having an aluminum back box giving either single or double threaded entry for maximum flexibility in installation. Weatherproof bells are supplied as a full fixing kit with gasket and screws.

Features

- Low current consumption - only 20mA
- Quickly and easily installed
- Excellent sound, up to 100dBA @ 1mt.
- Suitable for indoor and outdoor use
- Easy installation and connection.
- Operating Voltage:
 - 6VDC, 12VDC, 24V DC
 - 120VAC, 220VAC



XENON BEACON

MODEL: XB1000 SERIES

Nominal Voltage	: 24VDC
Current	: 40mA
Colour	: Red
Flash Frequency	: 1Hz
Flash Energy	: 0.7J
Weight	: 300 grams



ABORT SWITCH

MODEL: AS500 SERIES

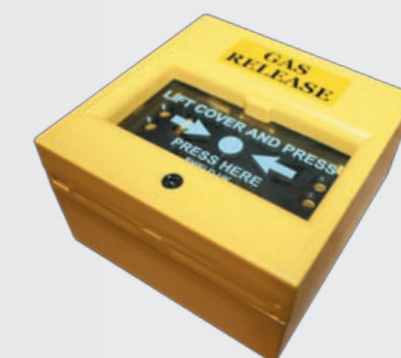
Supply Voltage	: 24VDC
Electrical Monitoring	: 470R series resistor
Operating Temperature	: -20°C to + 80°C
Colour	: Blue with transparent colour (Optional)



MANUAL RELEASE STATION

MODEL: RS1000 SERIES

Supply Voltage	: 24VDC
Electrical Monitoring	: 470R series resistor
Operating Temperature	: -20°C to + 80°C
Colour	: Yellow with transparent colour (Optional)





Australian Standard

QUALITY SYSTEM

National Fire Fighting Manufacturing FZCO is certified to ISO 9001 Quality system by Underwriters Laboratories Inc, Loss Prevention Certification Board UK & Bureau Veritas. Our manufacturing processes are based on a quality system that ensures the use of raw material confirming to relevant International Standards. Our In process production is monitored by work standards & quality plans confirming to relevant International standards enabling us to deliver quality products.

APPROVALS

NAFFCO has successfully achieved ISO 9001 Quality Management system certified by UL, LPCB & BV. Further we have achieved Product certification from UL, FM, LPCB, BSI, CE & SAI Global on wide range of products which include Fire Extinguishers, Fire Hose Reels, Centrifugal Fire Pumps, Diesel Engine for driving Fire pumps, Fire doors, Fire Fighting equipment & Certification for Fire Alarm systems installations.

ENGINEERING CAPABILITIES

NAFFCO is backed by a team of professionals who are well qualified and specialized in their respective field viz - Design, Development, Production and Project Implementation. Our investment in applied research and development program concentrates on innovations which meets customer needs.

PRODUCT RANGE



Hoses & Accessories



Extinguishers



Reels & Cabinets



Valves & Hydrants



Suppression System



Low Voltage Systems



Pumps



Fire Doors



Fire Trucks



NFPA & Training



Valves & Riser



CAFS



Passive Fire Protection

We reserve the right to modify specifications without prior notice

Our Aim is to become your supplier of choice while focusing on value added products and services that matter most to you



National Fire Fighting Manufacturing FZCO